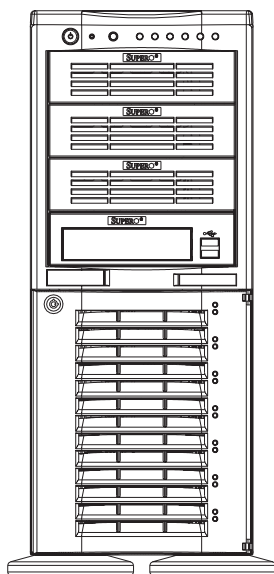


# SUPER<sup>®</sup>

## SUPERWORKSTATION 7043A-8R SUPERWORKSTATION 7043A-i



## USER'S MANUAL

1.0c

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## Preface

### About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperWorkstation 7043A-8R/7043A-i. Installation and maintenance should be performed by experienced technicians only.

The SuperWorkstation 7043A-8R/7043A-i is a high-end, dual processor 4U tower/rackmountable server based on the SC742S-600/SC742i-450 4U rackmount server chassis and the X5DA8/X5DAE, a dual processor motherboard that supports single or dual Intel Xeon® processors up to 3.20 GHz at a Front Side (System) Bus speed of 533/400 MHz and up to 12 GB DDR266 (PC2100) SDRAM main memory.

### Manual Organization

#### Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the SUPER X5DA8/X5DAE mainboard and the SC742S-600/SC742i-450 chassis, which comprise the SuperWorkstation 7043A-8R/7043A-i.

#### Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperWorkstation 7043A-8R/7043A-i into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

#### Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

## **Chapter 4: System Safety**

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperWorkstation 7043A-8R/7043A-i.

## **Chapter 5: Advanced Motherboard Setup**

Chapter 5 provides detailed information on the X5DA8/X5DAE motherboard, including the locations and functions of connections, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

## **Chapter 6: Advanced Chassis Setup**

Refer to Chapter 6 for detailed information on the SC742S-600/SC742i-450 server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SCSI or peripheral drives and when replacing system power supply units and cooling fans.

## **Chapter 7: BIOS**

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

## **Appendix A: BIOS POST Messages**

## **Appendix B: BIOS POST Codes**

## **Appendix C: System Specifications**

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# Chapter 1

## Introduction

### 1-1 Overview

The Supermicro SuperWorkstation 7043A-8R/7043A-i is a high-end dual processor server that can be utilized either in a tower or in a rackmount configuration. The SuperWorkstation 7043A-8R/7043A-i is comprised of two main subsystems: the SC742S-600/450 high-end server chassis and the X5DA8/X5DAE dual Xeon processor mainboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperWorkstation 7043A-8R/7043A-i.

In addition to the mainboard and chassis, various hardware components have been included with the SuperWorkstation 7043A-8R/7043A-i, as listed below:

- Two (2) CPU heatsinks (FAN-0050-CFT)
- Two (2) heatsink retention clip assemblies (SKT-095-604E)
- One (1) 3.5" floppy drive
- Three (3) 5.25" drive bays
- One (1) ribbon cable for IDE CD-ROM
- One (1) ATA100 ribbon cable for IDE hard drives (7043A-i only)
- One (1) USB 2.0 cable for front side access
- One (1) dual channel SCA SCSI backplane (7043A-8R only)
- Seven (7) SCA **1-inch high** SCSI drive carriers (7043A-8R only)
- SCSI Accessories (7043A-8R only)
  - One (1) internal 68-pin Ultra320 SCSI cable for SCA SCSI backplane
  - One (1) set of SCSI driver diskettes
  - One (1) SCSI manual

You should also have received a User's Manual and Supermicro diskettes, which contains several drivers and utilities.

## **1-2 Motherboard Features**

At the heart of the SuperWorkstation 7043A-8R/7043A-i lies the X5DA8/X5DAE, a dual processor motherboard designed to provide maximum performance. Below are the main features of the X5DA8/X5DAE.

### **Chipset Overview**

The X5DA8/X5DAE is based on Intel's E7505 chipset. See Figure 1-1 for a block diagram of the chipset. The E7505 chipset consists of three major components: the Memory Controller Hub (MCH), the I/O Controller Hub 4 (ICH4) and the PCI-X 64-bit Hub 2.0 (P64H2).

### **Memory Controller Hub (MCH)**

The MCH has four hub interfaces, one to communicate with the ICH4 and three for high-speed I/O communications. The MCH employs a 144-bit wide memory bus for a DDR-266 memory interface, which provides a total bandwidth of 4.27 GB/s. The ICH4 interface is a 266 MB/sec point-to-point connection using an 8-bit wide, 66 MHz base clock at a 4x data transfer rate. The P64H2 interface is a 1 GB/s point-to-point connection using a 16-bit wide, 66 MHz base clock at an 8x data transfer rate.

### **I/O Controller Hub (ICH4)**

The ICH4 I/O Controller Hub provides various integrated functions, including a two-channel Ultra ATA/100 bus master IDE controller, USB 2.0 host controllers, an integrated LAN controller, a System Management Bus controller and an AC'97 compliant interface.

## **P64H2 PCI-X Hub**

The P64H2 PCI-X Hub provides a 16-bit connection to the MCH for high-performance IO capability and two independent 64-bit PCI-X interfaces.

## **Processors**

The X5DA8/X5DAE supports single or dual 604-pin Intel Xeon processors of up to 3.20 GHz with a 533/400 MHz FSB. Please refer to the motherboard description pages on our web site for a complete listing of supported processors ([http://www.supermicro.com/Product\\_page/product-m.htm](http://www.supermicro.com/Product_page/product-m.htm)).

## **Memory**

The X5DA8/X5DAE has six 184-pin DIMM slots that can support up to 12 GB of registered ECC DDR266 (PC2100) SDRAM. Module sizes of 128MB, 256MB, 512MB 1GB and 2GB may be used to populate the DIMM slots. (The X5DA8/X5DAE was designed to support 2GB DIMM modules in each slot, however 2GB memory modules have not yet been validated.)

## **Onboard SCSI (7043A-8R)**

Onboard SCSI is provided with an Adaptec AIC-7902 SCSI chip, which supports dual channel, Ultra320 SCSI at a throughput of 320 MB/sec for each channel. The X5DA8 provides two LVD Ultra320 SCSI ports and one 50-pin Ultra SCSI port.

## **PCI Expansion Slots**

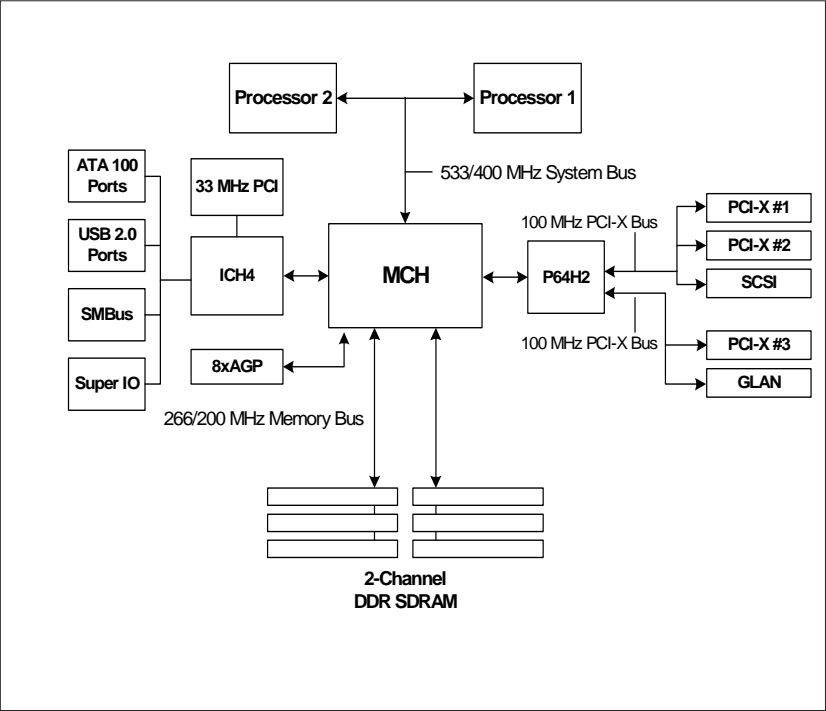
The X5DA8/X5DAE has three PCI-X expansion slots, two 32-bit PCI slots and one 8xAGP slot for video cards. The speed of the PCI-X slots may be changed in BIOS. See Chapter 7 for details.

## **Onboard Controllers/Ports**

One floppy drive controller and two onboard ATA/100 controllers are provided to support up to four hard drives or ATAPI devices. The color-coded I/O ports include two COM ports, a parallel port, two USB ports, PS/2 mouse and keyboard ports and one G-bit Ethernet port. Two front side USB ports are also included on the front of the chassis.

### Other Features

Other onboard features that promote system health include onboard voltage monitors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.



**Figure 1-1. Intel E7505 Chipset:  
System Block Diagram**

**Note:** This is a general block diagram. Please see Chapter 5 for details on the features of each motherboard.

## 1-3 Server Chassis Features

The SuperWorkstation 7043A-8R/7043A-i is a high-end, scalable server platform designed with today's most state-of-the-art features. The following is a general outline of the main features of the SC742S-600 (7043A-8R) and SC742i-450 (7043A-i) server chassis.

### **System Power**

The 7043A-8R features a triple redundant 600W power supply that consists of three separate power supply modules. These modules all share the load and run continuously. If any of the three fail, the remaining two pick up the load and keep the system running without interruption. A failed power supply module will also activate an alarm and illuminates the power fail LED. An alarm reset button is located on the back of the power supply to deactivate the power fail alarm. The power supply modules are all hot-swappable, so you don't have to power down the system to replace a module.

The 7043A-i has a single 450W power supply with a redundant cooling fan and a thermal control feature.

### **SCSI Subsystem (7043A-8R)**

The SCSI subsystem supports up to 7 80-pin SCA Ultra320 SCSI hard drives. (Any standard 1" drives are supported. SCA = Single Connection Attachment.) The SCSI drives are connected to a dual-channel SCA backplane with SAF-TE. The SCSI drives are also hot-swap units. A RAID controller card can be used with the SCA backplanes to provide data security.

**Note:** The operating system you use must have RAID support to enable the hot-swap capability of the SCSI drives.

### **Front Control Panel**

The SuperWorkstation 7043A-8R/7043A-i's control panel provides you with system monitoring and control. LEDs indicate system power, HDD activity, network activity, overheat condition and power supply failure. A main power button, a system reset button and an NMI button are also included.

## **I/O Backplane**

The SC742 is an ATX form factor chassis that can be used as a tower or mounted as a 4U rackmount server. The I/O backplane provides seven motherboard expansion slots, two COM ports, a parallel port, two USB ports, PS/2 mouse and keyboard ports and a G-bit Ethernet port.

## **Cooling System**

The SC742S chassis has an innovative cooling design that includes two 9-cm hot-plug redundant system cooling fans (one only on the 7043A-i) and one heavy duty 12-cm exhaust fan. 7043A-i: The power supply includes both a primary and a secondary fan. All chassis and power supply fans operate continuously, except for the secondary power supply fan, which activates only when the primary fails or the temperature becomes too high. The primary power supply fan has a thermal feature that allows it to run slower (quieter).



## 1-4 Contacting Supermicro

### Headquarters

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Web Site: [www.supermicro.com](http://www.supermicro.com)

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Web Site: [www.supermicro.com.tw](http://www.supermicro.com.tw)

#### Technical Support:

Email: [support@supermicro.com.tw](mailto:support@supermicro.com.tw)  
Tel: 886-2-8228-1366, ext.132 or 139

**Notes**

## Chapter 2

# Server Installation

### 2-1 Overview

This chapter provides a quick setup checklist to get your SuperWorkstation 7043A-8R/7043A-i up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your SuperWorkstation 7043A-8R/7043A-i system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a motherboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components. The 7043A-8R/7043A-i may be employed either as a tower or mounted in a rack as a 4U rackmount chassis. If using it as a server, please read Server Precautions in the next section and then skip ahead to Section 2-5.

### 2-2 Unpacking the 7043A-8R/7043A-i

You should inspect the box the SuperWorkstation 7043A-8R/7043A-i was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the SuperWorkstation 7043A-8R/7043A-i. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

### 2-3 Preparing for Setup

The box the SuperWorkstation 7043A-8R/7043A-i was shipped in may include two sets of rail assemblies, two rail mounting brackets and mounting screws needed for installing the system into a rack (optional kit). Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you

begin the installation procedure outlined in the sections that follow.

### **Choosing a Setup Location:**

- Leave enough clearance in front of the system to enable you to open the front door completely (~25 inches).
- Leave approximately 30 inches of clearance in the back of the system to allow for sufficient airflow and ease in servicing.



### **Warnings and Precautions!**



### **Rack Precautions:**

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack.
- In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

### **Server Precautions:**

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot plug SCSI drives and power supply units to cool before touching them.
- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

## **Rack Mounting Considerations**

### **Ambient Operating Temperature**

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (T<sub>mra</sub>).

### **Reduced Airflow**

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

### **Mechanical Loading**

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

### **Circuit Overloading**

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

### **Reliable Ground**

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

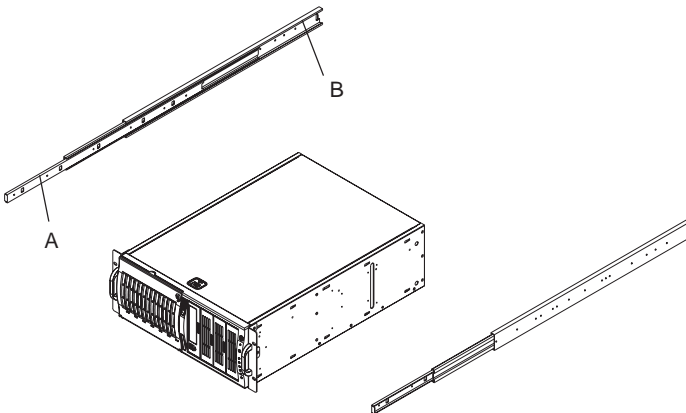
## 2-4 Installing the 7043A-8R/7043A-i into a Rack

This section provides information on installing the SuperWorkstation 7043A-8R/7043A-i into a rack unit. If the 7043A-8R/7043A-i has already been mounted into a rack or if you are using it as a tower, you can skip ahead to Sections 2-5 and 2-6. There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the 7043A-8R/7043A-i into a rack with the rack rails provided in the rackmount kit. You should also refer to the installation instructions that came with the rack unit you are using.

### Identifying the Sections of the Rack Rails:

The 7043A-8R/7043A-i rackmount kit (CSE-PT26 or CSE-PT26B - black) includes two rack rail assemblies. Each of these assemblies consist of three sections: an inner fixed chassis rail that secures to the 7043A-8R/7043A-i (A), an outer fixed rack rail that secures directly to the rack itself (B) and a sliding rail guide sandwiched between the two, which should remain attached to the fixed rack rail (see Figure 2-1.) The A and B rails must be detached from each other to install. Two chassis handles are also included with the rail kit.

To remove the fixed chassis rail (A), pull it out as far as possible - you should hear a "click" sound as a locking tab emerges from inside the rail assembly and locks the inner rail. Depress the locking tab to pull the inner rail completely out. Do this for both assemblies.



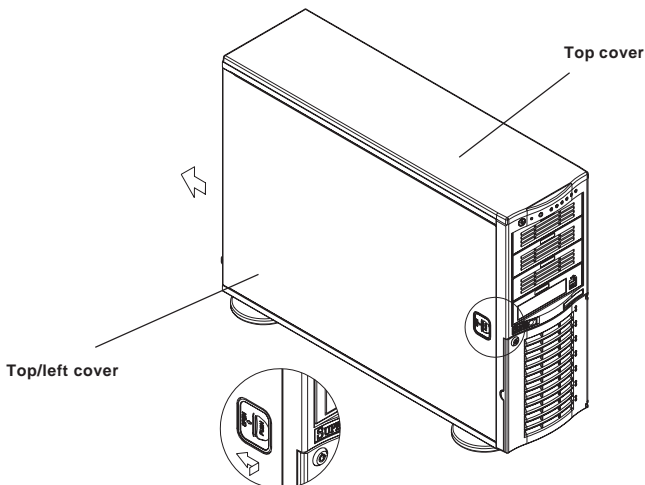
**Figure 2-1. Identifying the Sections of the Rack Rails**

## Installing the Chassis Rails:

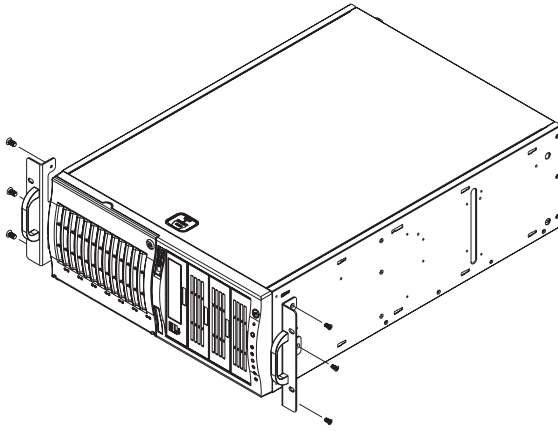
You will need to remove the top cover, the top/left cover and the feet to add rack rails to the chassis. First, remove the top/left cover by pushing the release tab in the center of the cover lip while pushing the cover toward the rear of the chassis (see Figure 2-2). After the cover stops, lift it off. Each chassis foot has a single screw. Remove the screw then depress the foot's locking tab from the inside of the chassis to slide the foot off. Next, remove the top cover. You should see a release tab at the middle of the lip. Push this tab toward the chassis edge while pushing the cover toward the front of the chassis. It should then lift right off. You can now attach rack rails to the top and bottom (now the sides) of the chassis. First add the rack handles as shown in Figure 2-3. Then position the fixed chassis rail sections you just removed along the side of the 7043A-8R/7043A-i making sure the screw holes line up. Note that these two rails are left/right specific. Screw the rail securely to the side of the chassis (see Figure 2-4). Repeat this procedure for the other rail on the other side of the chassis. You will also need to attach the rail brackets when installing into a telco rack.

**Locking Tabs:** As mentioned, both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

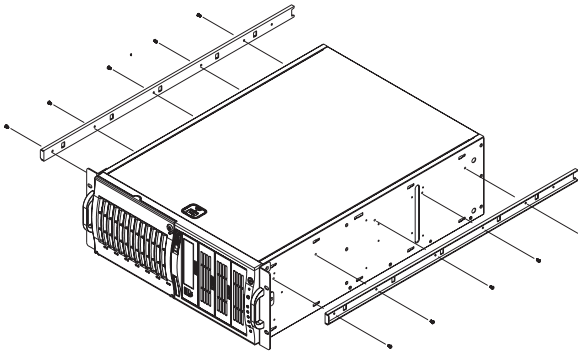
**Figure 2-2. Removing the Top/Left Cover**



**Figure 2-3. Installing the Rack Handles**



**Figure 2-4. Installing the Rails to the Chassis**



## Installing the Rack Rails:

Determine where you want to place the SuperWorkstation 7043A-8R/7043A-i in the rack. (See Rack and Server Precautions in Section 2-3.) Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure both are at the exact same height and with the rail guides facing inward.

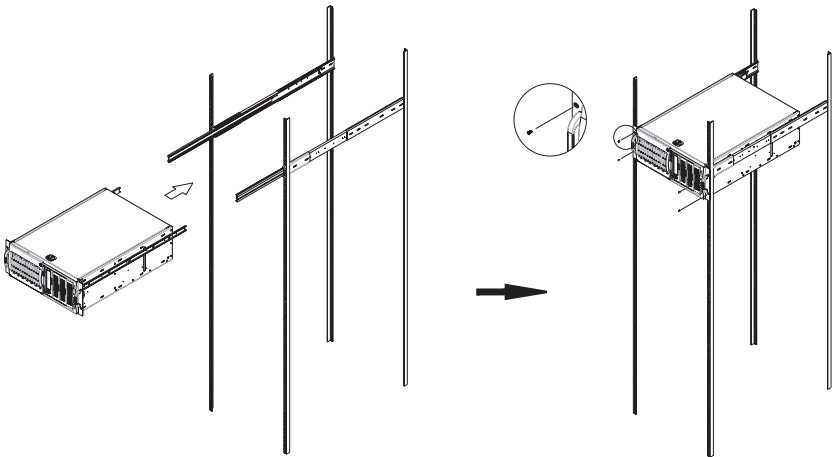


## Installing the Server into the Rack:

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting).

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumb-screws that hold the front of the server to the rack (see Figure 2-5).

**Figure 2-5. Installing the Server into a Rack**



## 2-5 Checking the Motherboard Setup

After setting up the the 7043A-8R/7043A-i, you will need to open the unit to make sure the motherboard is properly installed and all the connections have been made.

### 1. Accessing the inside of the 7043A-8R/7043A-i (see Figure 2-6):

(If rack mounted, first release the retention screws that secure the unit to the rack. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").) Depress the two buttons on the top (side if tower) of the chassis to release the cover. There is a large rectangular recess in the middle front of the cover to help you push the cover away from you until it stops. You can then lift the cover from the chassis to gain full access to the inside of the server.

### 2. Check the CPUs (processors):

You should have one or two processors already installed into the system board. Each processor should have its own heatsink attached. See Chapter 5 for instructions on processor installation.

### 3. CPU clock ratio setting:

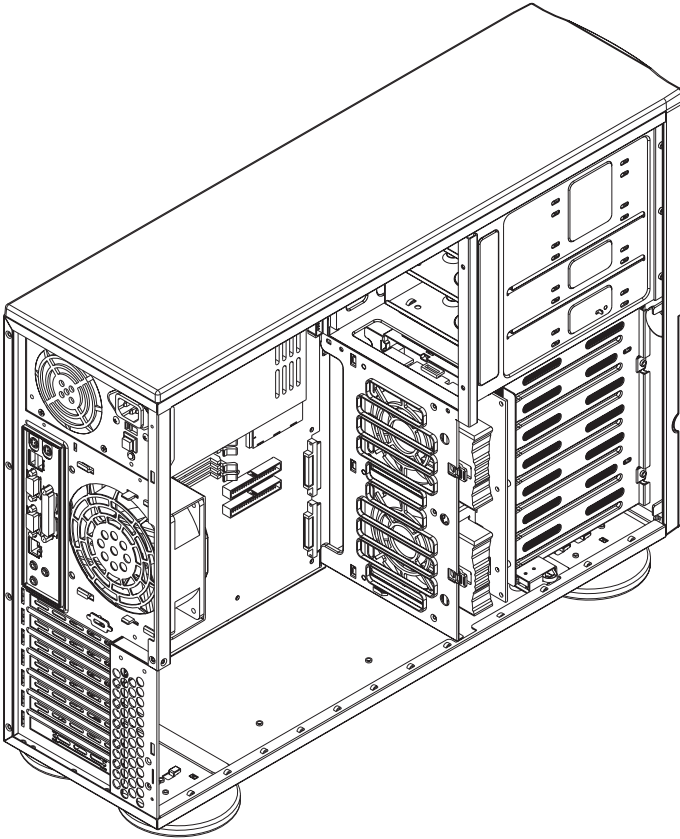
The CPU speed should be automatically detected. If not, you will need to set the correct speed with the BIOS Setup utility. See the Frequency Ratio setting in BIOS (Chapter 7) to set the processor speed.

### 4. Check the system memory:

Your 7043A-8R/7043A-i server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

### 5. Installing add-on cards:

If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.



**Figure 2-6. Accessing the Inside of the 7043A-8R/7043A-i  
(7043A-i shown)**

**6. Check all cable connections and airflow:**

Make sure all power and data cables are properly connected and not blocking the chassis airflow. See Chapter 5 for details on cable connections.

## **2-6 Checking the Drive Bay Setup**

Next, you should check to make sure the peripheral drives and the SCSI drives and SCA backplane have been properly installed and all connections have been made. SCSI components are for the 7043A-8R only.

**1. Accessing the drive bays:**

All drives can be accessed from the front of the server. For servicing the CD-ROM, IDE hard drives and floppy drives, you will need to remove the top/left chassis cover. The SCSI disk drives can be installed and removed from the front of the chassis without removing any chassis covers.

**2. Installing components into the 5.25" drive bay:**

To install components into the 5.25" drive bays, you must first remove the top/left chassis cover as described in the previous section. Refer to Chapter 6 for details.

**3. Installing CD-ROM and floppy disk drives:**

Refer to Chapter 6 if you need to reinstall a CD-ROM and/or floppy disk drive to the system.

**4. Check the SCSI disk drives:**

Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SCSI drives, please refer to Chapter 6.

**5. Check the airflow:**

Airflow is provided by two 9-cm cooling fans and a heavy duty 12-cm

exhaust fan. The system component layout was carefully designed to promote sufficient airflow through the 4U rackmount space. Also note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans. Keep this in mind when you reroute them after working on the system.

## **6. Supplying power to the system:**

The last thing you must do is to provide input power to the system. Plug the power cord from the power supply units into a high-quality power strip that offers protection from electrical noise and power surges. It is recommended that you use an uninterruptible power supply (UPS). Finally, depress the power on button on the front of the chassis.

## Notes

## Chapter 3

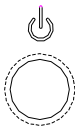
# System Interface

### 3-1 Overview

There are several LEDs on the control panel as well as two for each SCSI drive carrier (7043A-8R only) and one for the LAN (Ethernet) port. These LEDs are to keep you constantly informed of the overall status of the system and the activity and health of specific components. There are also three buttons on the chassis control panel.

### 3-2 Control Panel Buttons

There are three push-button buttons located on the front of the chassis. These are (in order from left to right) a power on/off button, an NMI (Non-Maskable Interrupt) button and a reset button.



- **POWER:** This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.



- **NMI:** NMI stands for "non-maskable interrupt". Pressing this button issues a non-maskable interrupt to force the server into a halt state. This is used for diagnostic purposes, and allows you to perform a memory download to determine the cause of a problem.

RESET



- **RESET:** Use the reset button to reboot the system.

### 3-3 Control Panel LEDs

The control panel located on the front of the SC742 chassis has six LEDs that provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.



- **Power:** Indicates external power is being supplied to the system's power supply unit. This LED should normally be illuminated when the system is operating.



- **HDD:** Indicates IDE channel activity. On the SuperWorkstation 7043A-8R/7043-i, this LED indicates CD-ROM drive activity when flashing.



NIC1

- **NIC1:** Indicates network activity on LAN1 when flashing.



NIC2

- **NIC2:** Non-applicable (system only includes one LAN port).





- **Overheat:** Indicates a processor overheat condition. This may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. You should also check to make sure that the chassis covers are installed and that all fans are present and operating normally. Finally, verify that the heatsinks are installed properly (see Chapter 5).



- **Power Fail:** Indicates a power supply module has failed. The remaining two power supply modules will take the load to keep the system running continuously, but the failed module will need to be replaced. You do not need to shut down the system to replace the failed module. Refer to Chapter 6 for details on replacing the power supply module. This LED should be off when the system is operating normally.

### 3-4 SCSI Drive Carrier LEDs (7043A-8R)

Each SCSI drive carrier has two LEDs.

- **Green:** When illuminated, the green LED on the front of the SCSI drive carrier indicates drive activity. A connection to the SCSI SCA backplane enables this LED to blink on and off when that particular drive is being accessed.
- **Red:** A SAF-TE compliant backplane is needed to activate the red LEDs, which indicate a drive failure. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

### 3-5 LAN (Ethernet) Port LEDs

The LAN port (located beside the COM2 port) has a yellow and a green LED. The yellow (left) LED indicates activity while the other (right) LED may be green, orange or off to indicate the speed of the connection. See the tables below for the functions associated with these LEDs.

**Gb LAN Left LED  
Indicator**

LED Color	Definition
Off	Not Active
Yellow	Active

**Gb LAN Right LED  
Indicator**

LED Color	Definition
Off	No Connection
Green	100 MHz
Orange	1 GHz

## Chapter 4

### System Safety

#### 4-1 Electrical Safety Precautions



Basic electrical safety precautions should be followed to protect yourself from harm and the SuperWorkstation 7043A-8R/7043A-i from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the motherboard, memory modules and the CD-ROM and floppy drives. When disconnecting power, you should first power down the system with the operating system and then unplug the power cords of all the power supply units in the system.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease electrostatic discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cord must include a grounding plug and must be plugged into grounded electrical outlets.
- Motherboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed backwards, which will reverse its polarities. The positive side of the battery should be facing up and the negative side should facing the motherboard. This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.
- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

## 4-2 General Safety Precautions



Follow these rules to ensure general safety:

- Keep the area around the SuperWorkstation 7043A-8R/7043A-i clean and free of clutter.
- The SuperWorkstation 7043A-8R/7043A-i weighs approximately 47/39 lbs. when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.
- Place the chassis top/side cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas

where power is present.

- After accessing the inside of the system, close the system back up and (if rackmounted) secure it to the rack unit with the retention screws after ensuring that all connections have been made.

### 4-3 ESD Precautions



Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

## 4-4 Operating Precautions



Care must be taken to assure that all chassis covers are in place when the 7043A-8R/7043A-i is operating to ensure proper cooling. Out of warranty damage to the 7043A-8R/7043A-i system can occur if this practice is not strictly followed.

## Chapter 5

# Advanced Motherboard Setup

This chapter covers the steps required to install processors and heatsinks to the X5DA8/X5DAE motherboard, connect the data and power cables and install add-on cards. All motherboard jumpers and connections are described and a layout and quick reference chart are included in this chapter. Remember to close the chassis completely when you have finished working on the motherboard to protect and cool the system sufficiently.

### 5-1 Handling the X5DA8/X5DAE Motherboard

Static electrical discharge can damage electronic components. To prevent damage to printed circuit boards, it is important to handle them very carefully (see Chapter 4). Also note that the size and weight of the motherboard can cause it to bend if handled improperly, which may result in damage. To prevent the motherboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from static discharge.

#### Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its anti-static bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their anti-static bags when not in use.

#### Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

## 5-2 PGA Processor and Heatsink Installation

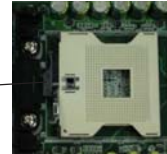


*When handling the processor package, avoid placing direct pressure on the label area of the fan. Also, do not place the motherboard on a conductive surface, which can damage the BIOS battery and prevent the system from booting up.*

**IMPORTANT:** Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket **before** you install the heatsink. The X5DA8/X5DAE can support either one or two Intel Xeon processors of up to 3.06 GHz. If installing one processor only, install it into CPU socket #1. (Note: pictures below show 603-pin sockets.)

1. Lift the lever on the CPU socket.  
Lift the lever completely or you will damage the CPU socket when power is applied. (Install a processor into CPU #1 socket first.)

Socket lever



2. Install the CPU in the socket marked "CPU1". Make sure that pin 1 of the CPU is seated on pin 1 of the socket (both corners are marked). When using only one CPU, install it into CPU socket #1 (CPU socket #2 is automatically disabled if only one CPU is used).

Pin 1



3. Press the lever down until you hear it \*click\* into the locked position. See Figure 5-1 for pictures of the 604-pin CPU socket before and after the processor is installed.

Socket lever in locked position





4. Apply the proper amount of thermal compound to the CPU die and place the heatsink on top of the CPU. Make sure the heatsink sits completely flat on the CPU. If not completely flat, the space between the two will degrade the heat dissipation function of the heatsink, which may cause the processor to overheat.

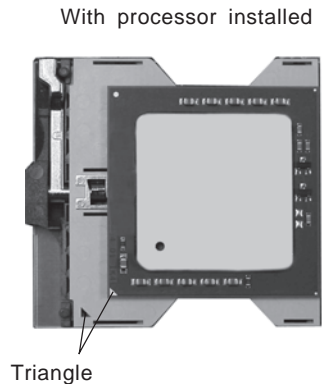
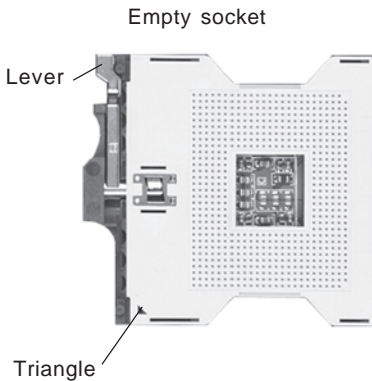
5. Secure the heatsink by locking the retention clips into their proper position. When correctly installed, the retention clips should \*click\* into place and the three black tabs on the CPU retention pieces should protrude fully through the corresponding holes on the retention clips. See Figures 5-2a and 5-2b for diagrams of the retention clips and the heatsink installation procedure.

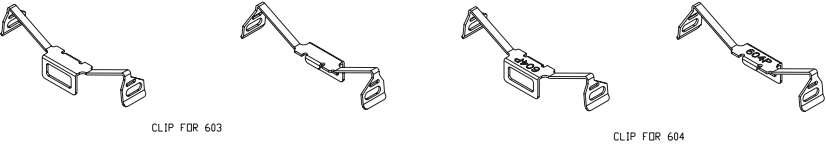
6. If installing two processors, repeat these steps to install the second processor in the CPU #2 slot.

**Figure 5-1. 604-pin PGA Socket: Empty and with Processor Installed**

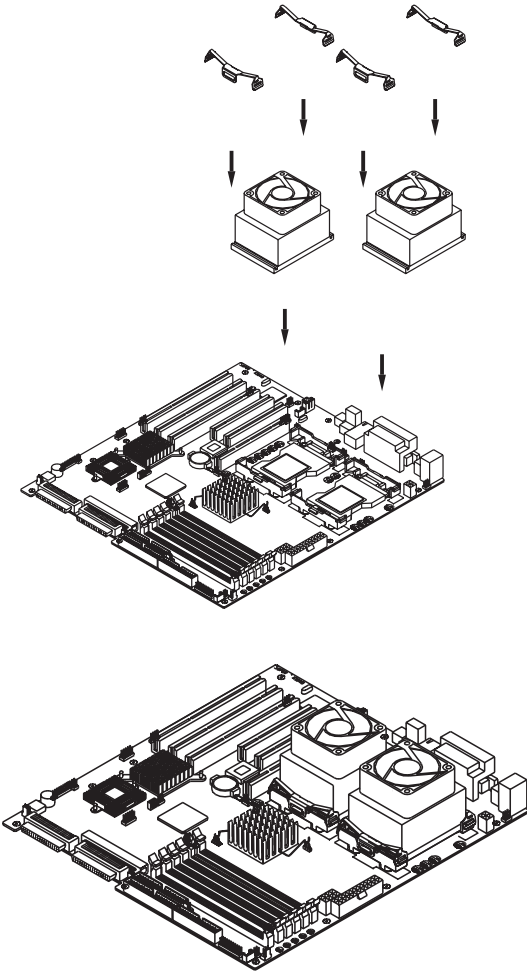


**Warning!** Make sure you lift the lever completely when installing the CPU. If the lever is only partly raised, damage to the socket or CPU may result.





**Figure 5-2a. Retention Clips (left: 603-pin, right: 604-pin)**



**Figure 5-2b. Heatsink Installation**

## 5-3 Connecting Cables

Now that the processors are installed, the next step is to connect the cables to the board. These include the data (ribbon) cables for the peripherals and control panel and the power cables.

### Connecting Data Cables

The ribbon cables used to transfer data from the peripheral devices have been carefully routed in preconfigured systems to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). If you are configuring the system, keep the airflow in mind when routing the cables. The following data cables (with their motherboard connector locations noted) should be connected. See the motherboard layout figure in this chapter for connector locations.

- IDE Device Cables (J2 and J3)
- Floppy Drive Cable (JP7)
- Ultra 320 LVD SCSI Cables (JA1 and JA2, 7043A-8R only)
- Control Panel Cable (JF2, see next page)

### Connecting Power Cables

The X5DA8/X5DAE has a 24-pin primary power supply connector designated "ATX Power" for connection to the ATX power supply. Connect the appropriate connector from the power supply to the "ATX Power" connector to supply power to the motherboard. The Processor Power Connector (at J15) must also be connected to your power supply. See the Connector Definitions section in this chapter for power connector pin definitions.

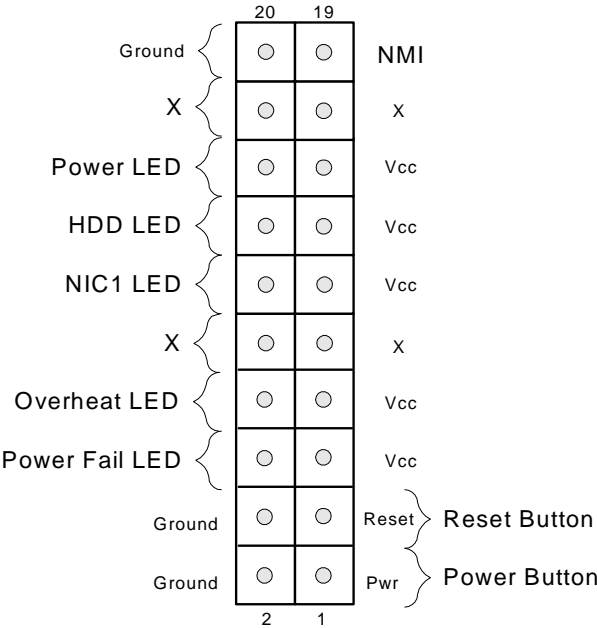
## Connecting the Control Panel

JF2 contains header pins for various front control panel connectors. See Figure 5-3 for the pin locations of the various front control panel buttons and LED indicators. Please note that even and odd numbered pins are on opposite sides of each header.

All JF2 wires have been bundled into single ribbon cable to simplify their connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel printed circuit board, located just behind the system status LEDs in the chassis.

See the Connector Definitions section in this chapter for details and pin descriptions of JF2.

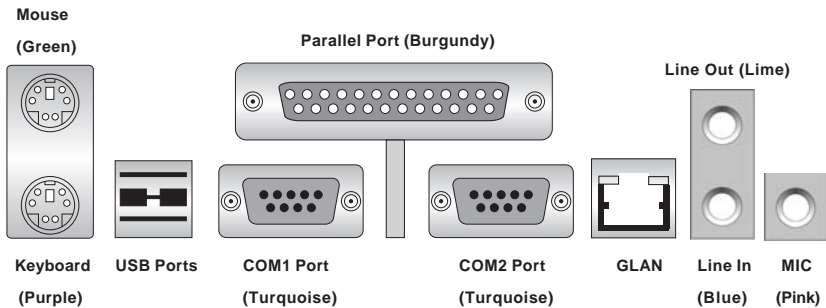
**Figure 5-3. X5DA8/X5DAE Front Control Panel Header Pins**



## 5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-4 below for the colors and locations of the various I/O ports.

**Figure 5-4. X5DA8/X5DAE Rear Panel I/O Ports**



## 5-5 Installing Memory

**Note:** Check the Supermicro web site for recommended memory modules:  
[http://www.supermicro.com/TECHSUPPORT/FAQs/Memory\\_vendors.htm](http://www.supermicro.com/TECHSUPPORT/FAQs/Memory_vendors.htm)

### **CAUTION**

Exercise extreme care when installing or removing DIMM modules to prevent any possible damage. Also note that the memory is interleaved to improve performance (see step 1).

### **DIMM Installation (See Figure 5-5)**

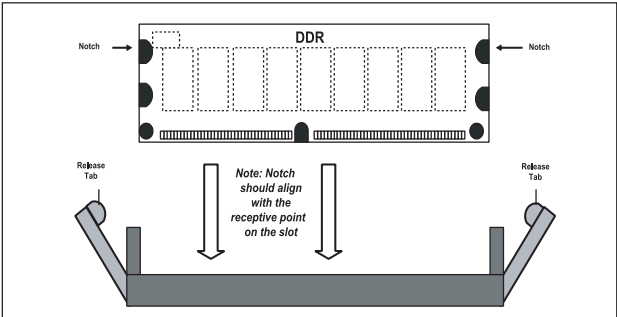
1. Insert the desired number of DIMMs into the memory slots, starting with Bank 1. The memory scheme is interleaved so you must install two modules at a time, beginning with Bank 1, then Bank 2, and so on.
2. Insert each DIMM module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the DIMM module incorrectly.
3. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules (see step 1 above).

**Memory Support**

The X5DA8/X5DAE only supports ECC registered DDR266 (PC2100) memory. This product was designed to support 2 GB modules in each slot, but it has only been verified for up to 1 GB modules. PC100/133 SDRAM is not supported.

**Note:** you should not mix memory modules of different sizes and/or speeds.

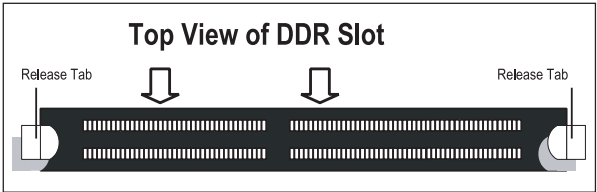
**Figure 5-5a. Side View of DIMM Installation into Slot**



**To Install:** Insert module vertically and press down until it snaps into place. Pay attention to the bottom notch.

**To Remove:** Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

**Figure 5-5b. Top View of DIMM Slot**



## 5-6 Adding PCI Cards

### 1. PCI slots:

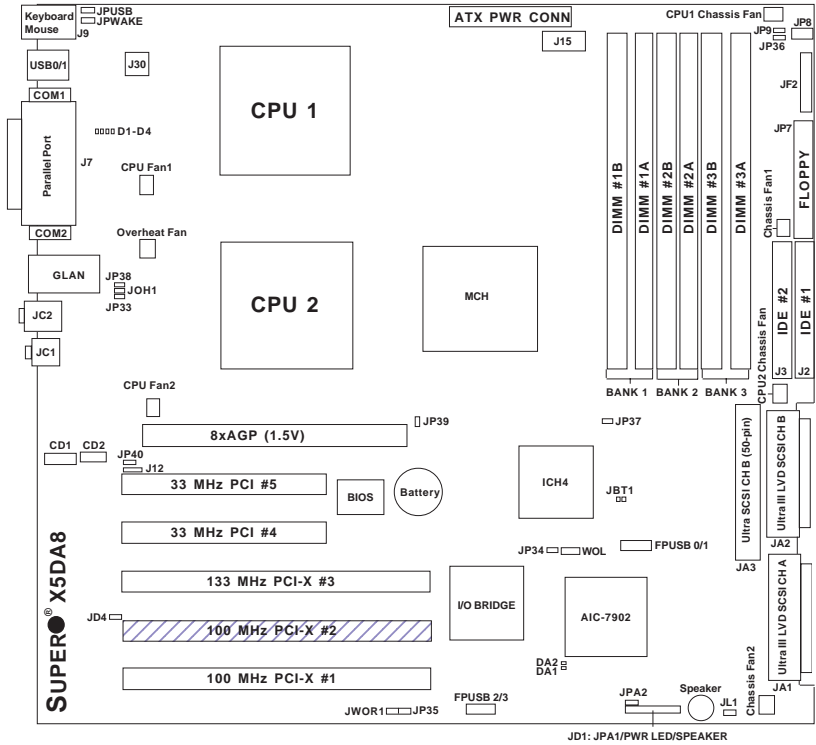
The X5DA8/X5DAE has one 64-bit 133 MHz PCI-X slot, two 64-bit 100 MHz PCI-X slots, two 32-bit 33 MHz PCI slots and one 8xAGP slot.

### 2. PCI card installation:

Before installing a PCI add-on card, make sure you install it into a slot that supports the speed of the card (see step 1, above). Begin by swinging the release tab on the I/O backpanel shield out to the left for the PCI slot. Insert the PCI card into the correct slot on the motherboard), pushing down with your thumbs evenly on both sides of the card. Finish by pushing the release tab back to its original (locked) position. Follow this procedure when adding a card to other slots.

# 5-7 Motherboard Details

**Figure 5-7. SUPER X5DA8\* Layout**  
(not drawn to scale)



**Note:** the X5DAE shares the same layout, but does not include onboard SCSI controller or connectors.



## X5DA8/X5DAE Quick Reference

<b><u>Jumper</u></b>	<b><u>Description</u></b>	<b><u>Default Setting</u></b>
JBT1	CMOS Clear	See Chapter 2
JD4	GLAN Enable/Disable	Pins 1-2 (Enabled)
JP9	Power Fail Alarm En/Disable	Open (Disabled)
JP33	CPU Chassis/CPU Fan Select	Closed (CPU Fan)
JP34*	SCSI Enable/Disable	Pins 1-2 (Enabled)
JP37	Watch Dog Enable/Disable	Pins 1-2 (Reset)
JP38	Thermal Fan Enable/Disable	Open (BIOS Control)
JP39	System (Front Side) Bus Speed	Pins 1-2 (Auto)
JP40	Onboard Audio Enable/Disable	Pins 1-2 (Enabled)
JPA1/JPA2*	SCSI CH A/B Termination	Open (Enabled)
JPUSB	USB Wake-up	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake-up	Pins 1-2 (Disabled)

<b><u>Connector</u></b>	<b><u>Description</u></b>
ATX PWR CONN	Primary ATX Power Connector
CD1/CD2	Audio CD Input (large/small)
COM1/COM2	COM1/COM2 Serial Port Connector
CPU/CHS/OH FAN	CPU/Chassis/Overheat Fan Headers
DIMM#1A-DIMM#3B	Memory (RAM) Slots
FPUSB0/1/2/3	Front Panel USB Headers
GLAN	G-bit Ethernet Port
J2/J3	IDE1/2 Hard Disk Drive Connector
J7	Parallel (Printer) Port
J9	PS/2 Keyboard/Mouse Ports
J15	Processor Power Connector
J30	Power Conn. (for use with AGP Pro cards)
JA1/JA2/JA3*	Ultra320 SCSI CH A/B/B(50-pin) Connector
JC1/JC2	MIC/LINE IN LINE OUT
JD1	PWR LED/Speaker/NMI Header
JF2	Front Control Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat LED
JP7	Floppy Disk Drive Connector
JP8	Third Power Supply Fail Header
JP35	Keylock Switch Connector
JP36	Power Supply Fail Alarm Reset Switch
JWOR1	Wake-on-Ring Header
USB0/1	Universal Serial Bus Ports
WOL	Wake-on-LAN Header

\* X5DA8 only

## 5-8 Connector Definitions

### ATX Power Connector

The main power supply connector on the X5DA8/X5DAE meets the SSI (Superset ATX) 24-pin specification, however it also supports a 20-pin power supply connector. Make sure that the orientation of the connector is correct. See the table on the right for pin definitions.

**ATX Power Supply 24-pin Connector  
Pin Definitions**

Pin Number	Definition	Pin Number	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON#	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res(NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

### Processor Power Connector

In addition to the Primary ATX power connector (above), the 12v 8-pin Processor connector at J15 must also be connected to your power supply. See the table on the right for pin definitions.

**8-Pin +12v Power Supply  
Connector (J15)**

Pins	Definition
1 thru 4	Ground
5 thru 8	+12V

### NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF2. Refer to the table on the right for pin definitions.

**NMI Button Pin  
Definitions (JF2)**

Pin Number	Definition
19	Control
20	Ground

### Power LED

The Power LED connection is located on pins 15 and 16 of JF2. Refer to the table on the right for pin definitions.

**PWR\_LED Pin Definitions  
(JF2)**

Pin Number	Definition
15	Vcc
16	Control

## HDD LED

The HDD LED connection (for IDE or SCSI Disk Drives) is located on pins 13 and 14 of JF2. Attach the hard drive LED cable here to display disk activity. See the table on the right for pin definitions.

**HDD LED Pin  
Definitions  
(JF2)**

Pin Number	Definition
13	Vcc
14	HD Active

## NIC LED

The NIC (Network Interface Controller) LED connection for the GLAN port is located on pins 11 and 12 of JF2. Attach the NIC LED cable to display network activity. Refer to the table on the right for pin definitions.

**NIC LED Pin  
Definitions  
(JF2)**

Pin Number	Definition
11	Vcc
12	GND

## Overheat LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF2 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

**Overheat (OH) LED  
Pin Definitions  
(JF2)**

Pin Number	Definition
7	Vcc
8	GND

## Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF2. Refer to the table on the right for pin definitions.

**Power Fail Button  
Pin Definitions  
(JF2)**

Pin Number	Definition
5	Vcc
6	GND

### Reset Button

The Reset Button connection is located on pins 3 and 4 of JF2. Attach it to the hardware reset switch on the computer case. Refer to the table on the right for pin definitions.

**Reset Pin  
Definitions  
(JF2)**

Pin Number	Definition
3	Reset
4	Ground

### Power Button

The Power Button connection is located on pins 1 and 2 of JF2. Momentarily contacting both pins will power on/off the system. This button can also be configured to function as a suspend button (with a setting in BIOS - see Chapter 4). To turn off the power when set to suspend mode, depress the button for at least 4 seconds. Refer to the table on the right for pin definitions.

**Power Button  
Connector  
Pin Definitions  
(JF2)**

Pin Number	Definition
1	PW_ON
2	Ground

### Chassis Intrusion

A Chassis Intrusion header is located at JL1. Attach the appropriate cable to inform you of a chassis intrusion.

### Universal Serial Bus (USB0/1)

Two USB ports are located beside the PS/2 keyboard/mouse ports. USB0 is the bottom connector and USB1 is the top connector. See the table on the right for pin definitions.

**Universal Serial Bus Pin Definitions  
USB0 USB1**

Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

## Front Panel Universal Serial Bus Headers

Extra USB headers (FPUSB0/FPUSB1/FPUSB2/FPUSB3) can be used for front side USB access. You will need a USB cable to use either connection. Refer to the tables on the right for pin definitions.

Front Panel Universal Serial Bus Pin Definitions

FPUSB0/FPUSB2		FPUSB1/FPUSB3	
Pin Number	Definition	Pin Number	Definition
1	+5V	1	+5V
2	P0-	2	P0-
3	P0+	3	P0+
4	Ground	4	Ground
5	N/A	5	Key

## Serial Ports

The COM1 and COM2 serial ports are located under the parallel port (see Figure 5-4). See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1, COM2)

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

## GLAN (Ethernet Port)

A G-bit Ethernet port (designated GLAN) is located beside the COM2 port on the IO backplane. This port accepts RJ45 type cables.



## ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and PS/2 mouse are located on J9. See the table at right for pin definitions. (See Figure 5-4 for the locations of each.)

PS/2 Keyboard and Mouse Port Pin Definitions (J9)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

## Fan Headers

The X5DA8/X5DAE has six fan headers, which are designated CPU Fan1, CPU Fan2, CPU1 Chassis Fan, CPU2 Chassis Fan, Chassis Fan1, Chassis Fan2 and Overheat Fan. See the table on the right for pin definitions.

**Fan Header Pin Definitions**

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: Fan headers are DC power.

## Power LED/Speaker

On the JDI header, pins 1-3 are for a power LED and pins 4-7 are for the speaker. See the table on the right for speaker pin definitions. **Note:** The speaker connector pins are for use with an external speaker. If you wish to use the onboard speaker, you should close pins 6-7 with a jumper.

**Speaker Connector Pin Definitions (JD1)**

Pin Number	Function	Definition
4	+ Key	Red wire, Speaker data
5		No connection
6		Key
7		Speaker data

## Third Power Supply Fail Header

Connect a cable from your power supply to the JP8 header to provide warning of power supply failure. This warning signal is passed through the PWR\_LED pin on JF2 to indicate a power failure on the chassis. See the table on the right for pin definitions. This feature will not function on the 7043A-i, which has only a single power supply module.

**Third Power Supply Fail Header Pin Definitions (JP8)**

Pin Number	Definition
1	P/S 1 Fail Signal
2	P/S 2 Fail Signal
3	P/S 3 Fail Signal
4	Reset (from MB)

**Note:** This feature is only available when using redundant Supermicro power supplies.

## Wake-On-LAN

The Wake-On-LAN header is designated WOL. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this feature. You must also have a LAN card with a Wake-on-LAN connector and cable.

**Wake-On-LAN Pin Definitions (WOL)**

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

## Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and "wake-up" by an incoming call to the modem when in suspend state. See the table on the right for pin definitions. You must have a Wake-On-Ring card and cable to use this feature.

**Wake-on-Ring Pin Definitions (JWOR)**

Pin Number	Definition
1	Ground
2	Wake-up

## Keylock

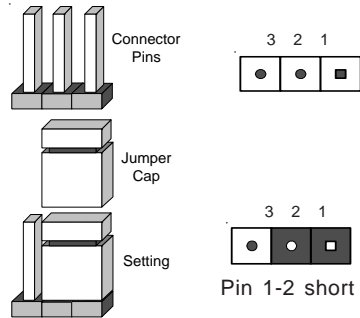
The keyboard lock connection is located on JP35. Utilizing this header allows you to inhibit any actions made on the keyboard, effectively "locking" it.

## 5-9 Jumper Settings

### Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout page for jumper locations.

**Note:** On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



### CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS. Clearing CMOS will also clear any passwords.

To clear CMOS, 1) First power down the system and unplug the power cord(s) 2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver 3) Remove the screwdriver (or shorting device) 4) Reconnect the power cord(s) and power on the system.

**Note:** Do not use the PW ON connector to clear CMOS.

### System Bus Speed

JP39 allows you to select Auto, 400 or 533 MHz for your system (front side) bus speed. The recommended Auto setting will automatically determine the system bus speed of your processor(s). See the table on the right for jumper settings.

**System Bus Speed  
Jumper Settings (JP39)**

Jumper Position	Definition
Pins 1-2	Auto
Pins 2-3	400 MHz
Open	533 MHz

"Auto" is the recommended setting.